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Eighth Quarterly Progress Report
(January - March 1975)

"A Cloud Physics Investigation
Utilizing Skylab Data"

Prepared for: Principal Investigator
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Code TF6
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Skylab Q. P. R.

Task I - Transmittances

a. Oxygen "A" Band

Calculations using the Lowtran II atmospheric transmission program, the solar spectrum, and S191 spectral response function were performed to see if the cause for the affect mentioned in previous Quarterly Report could be explained. These calculations show the affect. More calculations will be performed to further understanding of this affect.

b. 2.0 μ CO₂ Band

The Lowtran II atmospheric transmission program, S191 spectral response, and solar spectrum will be used to compute for a variety of cloud pressure levels, solar zenith angles and atmospheric pressure levels, the expected absorption for the 2.0 μ band.

Task II - Scattering Calculations

This task has been completed.

Task III - Cloud Models and Returned Signals

a. Cloud Models

This task has been completed.

b. Returned Signals

Pending completion of Task I b and finalization of our analysis procedures, we plan to combine the results of Tasks I, II, and III with instrument response data and solar spectra to simulate results.

Task IV - Deconvolution Procedure

There has been no change in the status of this task area since the last reporting period.

Task V - Background Meteorological Data

No additional background meteorological data was acquired during this reporting period.

Task VI - Analysis of Satellite Data

Analysis of the long wavelength data (i.e., the 1.61-, 2.06-, and 2.12 m channels) was begun. The data are screened for agreement in wavelength; the acceptance criterion being .003 m. The ratios $R_1 = \frac{I(1.61 \text{ m})}{I(2.12 \text{ m})}$ and $R_2 = \frac{I(2.06 \text{ m})}{I(2.12 \text{ m})}$ were computed for each individual scan. Then a mean value and a standard deviation were computed. Analysis of the short wavelength data has been delayed, pending study of a new reduction technique and the results of calculations described under Task I a.

SKYLAB DATA INVENTORY

DATE	TAPE	SO42-1 Tabs	DAC Available
SL-2			
4 June (155)	Yes	Yes	
5 June (156)	Yes	Yes ₁	
9 June (160)	Yes	Yes ₁	DAC data of
10 June (161)	Yes	No ₂	poor quality
12 June (163)	Yes	Yes ₃	for SL-2
13 June (164)	Yes	Yes ₃	
14 June (165)	No	Yes	
SL-3			
5 Aug (217)	Yes	Yes	Yes
8 Aug (220)	No	No	Yes
9 Aug (221)	Yes	Yes ₄	Yes
10 Sep (253)	Yes	Yes ₅	No
12 Sep (255)	Yes	Yes ₆	No
15 Sep (258)	Yes	Yes ₆	Yes
SL-4			
1 Dec (335)	Yes	No ₇	Yes
2 Dec (336)	Yes	Yes ₇	Yes
11 Jan (11)	Yes	Yes	Yes
12 Jan (12)	Yes	Yes	Yes
18 Jan (18)	Yes	Yes	Yes
20 Jan (20)	Yes	Yes ₈	Yes
22 Jan (22)	Yes	Yes ₉	Yes
24 Jan (24)	Yes	Yes ₁₀	Yes
25 Jan (25)	Yes	Yes ₁₀	Yes
31 Jan (31)	Yes	Yes ₁₀	No

Footnotes

- 1 Very large and rapid changes occur in the S/C coordinates between 15:05:51.137 and 15:05:55.113 Z.
- 2 Have values for 12:55:57.355 and 13:12:56.656 Z only. Need intermediate values.
- 3 Have 5 values between 13:48:11.00 and 14:00:31.823 Z. Need intermediate values.
- 4 There is a time discrepancy between the tape and the SO42-1 tabulations. Tape times are from 20:03:48 to 20:05:31 Z. Tabs are from 20:06:07 to 20:10:02 Z.
- 5 There are several "glitches" in the data which appear periodic. A copy of the tab sheet is enclosed with the glitches indicated.
- 6 Similar "glitches" appear in this data also.
- 7 From 16:44:06.120 to 16:44:25.627 all spacecraft coordinates are given as 99,999.xxx degrees; also 16:49:59.689 to 16:50:09.185.
- 8 There are a few "glitches" of the kind mentioned for 12 and 15 September.
- 9 The 99,999.xxx degree S/C coordinate problem occurs from 17:55:18.846 to 17:55:30.401.
- 10 The 99.999.xxx degree problem also occurs in data for January 25 and January 31.

ATTACHMENT

PAGE 1
DATE 10-OCT-
5042-1

S191 BORESSIGHT CAMERA PULSE CORRELATION

PROJECT MISSION 3 SENSOR S191			1-OPCA-0-36-42-1			RECORDING FORMAT			SITE 0			FLIGHT DATE 12 SEP 73			P073-1		
ANT			DO05-191			P063-SKY			P026-SKY			P023-SKY			P071-SKY		
GRT			RAD CAL			SUN ELEV			GEO LAT			LONG			CBL ALT		
VOLTS			VOLTS			DEG			DEG			DEG			KM		
PITCH			PITCH			DEG			PITCH			DEG			PITCH		
DEG			DEG			DEG			DEG			DEG			DEG		
17: 8:19.073	17: 8:24.839	4.917	4.132	58.8	35.117	-80.611	426.472	359.794	359.920	359.920	0.01	359.920	359.920	0.01	359.920	359.920	0.01
17: 8:22.352	17: 8:25.730	4.917	4.127	58.7	35.122	-80.616	426.477	359.799	359.797	359.797	0.01	359.797	359.797	0.01	359.797	359.797	0.01
17: 8:25.540	17: 8:28.918	4.917	4.121	58.6	35.127	-80.621	426.482	359.804	359.802	359.802	0.01	359.802	359.802	0.01	359.802	359.802	0.01
17: 8:28.728	17: 8:32.106	4.917	4.116	58.5	35.132	-80.626	426.487	359.809	359.807	359.807	0.01	359.807	359.807	0.01	359.807	359.807	0.01
17: 8:31.916	17: 8:35.294	4.917	4.111	58.4	35.137	-80.631	426.492	359.814	359.812	359.812	0.01	359.812	359.812	0.01	359.812	359.812	0.01
17: 8:35.104	17: 8:38.482	4.917	4.106	58.3	35.142	-80.636	426.497	359.819	359.817	359.817	0.01	359.817	359.817	0.01	359.817	359.817	0.01
17: 8:38.292	17: 8:41.670	4.917	4.101	58.2	35.147	-80.641	426.502	359.824	359.822	359.822	0.01	359.822	359.822	0.01	359.822	359.822	0.01
17: 8:41.480	17: 8:44.858	4.917	4.096	58.1	35.152	-80.646	426.507	359.829	359.827	359.827	0.01	359.827	359.827	0.01	359.827	359.827	0.01
17: 8:44.668	17: 8:47.846	4.917	4.091	58.0	35.157	-80.651	426.512	359.834	359.832	359.832	0.01	359.832	359.832	0.01	359.832	359.832	0.01
17: 8:47.856	17: 8:50.834	4.917	4.086	57.9	35.162	-80.656	426.517	359.839	359.837	359.837	0.01	359.837	359.837	0.01	359.837	359.837	0.01
17: 8:51.044	17: 8:54.022	4.917	4.081	57.8	35.167	-80.661	426.522	359.844	359.842	359.842	0.01	359.842	359.842	0.01	359.842	359.842	0.01
17: 8:54.232	17: 8:57.210	4.917	4.076	57.7	35.172	-80.666	426.527	359.849	359.847	359.847	0.01	359.847	359.847	0.01	359.847	359.847	0.01
17: 8:57.420	17: 8:60.398	4.917	4.071	57.6	35.177	-80.671	426.532	359.854	359.852	359.852	0.01	359.852	359.852	0.01	359.852	359.852	0.01
17: 8:60.608	17: 8:63.586	4.917	4.066	57.5	35.182	-80.676	426.537	359.859	359.857	359.857	0.01	359.857	359.857	0.01	359.857	359.857	0.01
17: 8:63.796	17: 8:66.774	4.917	4.061	57.4	35.187	-80.681	426.542	359.864	359.862	359.862	0.01	359.862	359.862	0.01	359.862	359.862	0.01
17: 8:66.984	17: 8:70.162	4.917	4.056	57.3	35.192	-80.686	426.547	359.869	359.867	359.867	0.01	359.867	359.867	0.01	359.867	359.867	0.01
17: 8:70.172	17: 8:73.350	4.917	4.051	57.2	35.197	-80.691	426.552	359.874	359.872	359.872	0.01	359.872	359.872	0.01	359.872	359.872	0.01
17: 8:73.360	17: 8:76.538	4.917	4.046	57.1	35.202	-80.696	426.557	359.879	359.877	359.877	0.01	359.877	359.877	0.01	359.877	359.877	0.01
17: 8:76.548	17: 8:79.726	4.917	4.041	57.0	35.207	-80.701	426.562	359.884	359.882	359.882	0.01	359.882	359.882	0.01	359.882	359.882	0.01
17: 8:79.736	17: 8:82.914	4.917	4.036	56.9	35.212	-80.706	426.567	359.889	359.887	359.887	0.01	359.887	359.887	0.01	359.887	359.887	0.01
17: 8:82.924	17: 8:86.102	4.917	4.031	56.8	35.217	-80.711	426.572	359.894	359.892	359.892	0.01	359.892	359.892	0.01	359.892	359.892	0.01
17: 8:86.112	17: 8:89.290	4.917	4.026	56.7	35.222	-80.716	426.577	359.899	359.897	359.897	0.01	359.897	359.897	0.01	359.897	359.897	0.01
17: 8:89.300	17: 8:92.478	4.917	4.021	56.6	35.227	-80.721	426.582	359.904	359.902	359.902	0.01	359.902	359.902	0.01	359.902	359.902	0.01
17: 8:92.488	17: 8:95.666	4.917	4.016	56.5	35.232	-80.726	426.587	359.909	359.907	359.907	0.01	359.907	359.907	0.01	359.907	359.907	0.01
17: 8:95.676	17: 8:98.854	4.917	4.011	56.4	35.237	-80.731	426.592	359.914	359.912	359.912	0.01	359.912	359.912	0.01	359.912	359.912	0.01
17: 8:98.864	17: 9:02.042	4.917	4.006	56.3	35.242	-80.736	426.597	359.919	359.917	359.917	0.01	359.917	359.917	0.01	359.917	359.917	0.01
17: 9:02.052	17: 9:05.230	4.917	4.001	56.2	35.247	-80.741	426.602	359.924	359.922	359.922	0.01	359.922	359.922	0.01	359.922	359.922	0.01
17: 9:05.240	17: 9:08.418	4.917	3.996	56.1	35.252	-80.746	426.607	359.929	359.927	359.927	0.01	359.927	359.927	0.01	359.927	359.927	0.01
17: 9:08.428	17: 9:11.606	4.917	3.991	56.0	35.257	-80.751	426.612	359.934	359.932	359.932	0.01	359.932	359.932	0.01	359.932	359.932	0.01
17: 9:11.616	17: 9:14.794	4.917	3.986	55.9	35.262	-80.756	426.617	359.939	359.937	359.937	0.01	359.937	359.937	0.01	359.937	359.937	0.01
17: 9:14.804	17: 9:17.982	4.917	3.981	55.8	35.267	-80.761	426.622	359.944	359.942	359.942	0.01	359.942	359.942	0.01	359.942	359.942	0.01
17: 9:18.072	17: 9:21.170	4.917	3.976	55.7	35.272	-80.766	426.627	359.949	359.947	359.947	0.01	359.947	359.947	0.01	359.947	359.947	0.01
17: 9:21.260	17: 9:24.358	4.917	3.971	55.6	35.277	-80.771	426.632	359.954	359.952	359.952	0.01	359.952	359.952	0.01	359.952	359.952	0.01
17: 9:24.368	17: 9:27.546	4.917	3.966	55.5	35.282	-80.776	426.637	359.959	359.957	359.957	0.01	359.957	359.957	0.01	359.957	359.957	0.01
17: 9:27.556	17: 9:30.734	4.917	3.961	55.4	35.287	-80.781	426.642	359.964	359.962	359.962	0.01	359.962	359.962	0.01	359.962	359.962	0.01
17: 9:30.744	17: 9:33.922	4.917	3.956	55.3	35.292	-80.786	426.647	359.969	359.967	359.967	0.01	359.967	359.967	0.01	359.967	359.967	0.01
17: 9:33.932	17: 9:37.110	4.917	3.951	55.2	35.297	-80.791	426.652	359.974	359.972	359.972	0.01	359.972	359.972	0.01	359.972	359.972	0.01
17: 9:37.118	17: 9:40.298	4.917	3.946	55.1	35.302	-80.796	426.657	359.979	359.977	359.977	0.01	359.977	359.977	0.01	359.977	359.977	0.01
17: 9:40.306	17: 9:43.486	4.917	3.941	55.0	35.307	-80.801	426.662	359.984	359.982	359.982	0.01	359.982	359.982	0.01	359.982	359.982	0.01
17: 9:43.494	17: 9:46.674	4.917	3.936	54.9	35.312	-80.806	426.667	359.989	359.987	359.987	0.01	359.987	359.987	0.01	359.987	359.987	0.01
17: 9:46.682	17: 9:49.862	4.917	3.931	54.8	35.317	-80.811	426.672	359.994	359.992	359.992	0.01	359.992	359.992	0.01	359.992	359.992	0.01
17: 9:49.870	17: 9:53.050	4.917	3.926	54.7	35.322	-80.816	426.677	359.999	359.997	359.997	0.01	359.997	359.997	0.01	359.997	359.997	0.01
17: 9:53.058	17: 9:56.238	4.917	3.921	54.6	35.327	-80.821	426.682	360.004	359.999	359.999	0.01	359.999	359.999	0.01	359.999	359.999	0.01
17: 9:56.246	17: 9:59.426	4.917	3.916	54.5	35.332	-80.826	426.687	360.009	360.007	360.007	0.01	360.007	360.007	0.01	360.007	360.007	0.01
17: 9:59.434	17: 10:02.614	4.917	3.911	54.4	35.337	-80.831	426.692	360.014	360.012	360.012	0.01	360.012	360.012	0.01	360.012	360.012	0.01
17: 10:02.622	17: 10:05.802	4.917	3.906	54.3	35.342	-80.836	426.697	360.019	360.017	360.017	0.01	360.017	360.017	0.01	360.017	360.017	0.01
17: 10:05.810	17: 10:08.990	4.917	3.901	54.2	35.347	-80.841	426.702	360.024	360.022	360.022	0.01	360.022	360.022	0.01	360.022	360.022	0.01
17: 10:09.000	17: 10:12.178	4.917	3.896	54.1	35.352	-80.846	426.707	360.029	360.027	360.027	0.01	360.027	360.027	0.01	360.027	360.027	0.01
17: 10:12.186	17: 10:15.366	4.917	3.891	54.0	35.357	-80.851	426.712	360.034	360.032	360.032	0.01	360.032	360.032	0.01	360.032	360.032	0.01
17: 10:15.374	17: 10:18.554	4.917	3.886	53.9	35.362	-80.856	426.717	360.039	360.037	360.037	0.01	360.037	360.037	0.01	360.037	360.037	0.01
17: 10:18.562	17: 10:21.742	4.917	3.881	53.8	35.367	-80.861	426.722	360.044	360.042	360.042	0.01	360.042	360.042	0.01	360.042	360.042	0.01